Process Information
RICH FM Reflector
Serial Number FM-00102

The following is process information regarding the fabrication of the RICH FM Mirror for the AMS-02. The FM was produced to the dimensions defined by the ICD specifications supplied by CGS under this contract.

Mirror Fabrication Overview, Mirror Substrates
The FM substrates were laid up using a quasi-isotropic ply orientation of $\pi/4$ yielding excellent figure reproduction of the mandrel in terms of circularity and radius of curvature. The lay up was vacuum bagged over the unpolished aluminum mandrel supplied by CGS.

The ideal shape of each segment is clearly marked on the mandrel before lay up so that the part is indelibly marked with the ideal shape upon removal of the mandrel after cure. The part was trimmed and prepared for surface with EX-1515 resin.

As the process for surfacing this type of mirror is considered proprietary, it will suffice to say that the mirror was covered with the polymer material to the exact surface characteristics of the mandrel. There are no coatings on any of the mirror segments.

FM Assembly
To guarantee circularity and concentricity of the flight model, FM, a fixture was designed to constrain the bottom edge of the mirror into a grove, which is machined precisely to the exact circularity required for the mirror. Similarly, the top edge will be held in circularity and the 16 929degree angle during the assembly process. The holding fixture is comprised of 2 circular grooves (FM top and bottom grooves) so the entire FM (all three segments) are held in complete circularity. The top edge holding fixture guarantees that the top edge is circular and concentric with the bottom edge of the FM. Once all 3 panels are precisely positioned in the groves the flanges and vertical ribs were glued in place with Huntsman 1210 A/B.

Inserts Four (4) inserts, 304 Stainless Steel, were provided on the lower flange of the FM. They were produced to the exact specifications provided in the ICD drawings. They were produced at CMA from 25mm round stock and cut on a manual lathe. They were produced as 2 "hat"-shaped parts 1 placed in the top of the base flange and one placed on the bottom of the Flange. They were glued into place using Huntsman 1210 A/B